AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

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LISTING OF CLAIMS

1. (Currently amended) In an electric power network, an advanced communications system employing an atomic communications system architecture, comprising:

a node element deployable on said electric power network and having a global port and an inward port, the electric power network having a plurality of hierarchy levels;

the node element having a global data store that is populated with information supplied via said global port and is accessible via said inward port;

the node element having a local data store that is populated with information supplied via said local port and is accessible via said global port;

the node element being configured to selectably support at least one of three planes of interaction using the information maintained within said global and inward data stores:

a power analysis plane of interaction,

a data plane of interaction, and

a control plane of interaction,

wherein the node element allows a plurality of load devices to exchange data, through the node element, using respective different protocols of the load devices;

wherein the node element includes a proxy having a universal format interface that makes available a local control interface of a first local load device available and that allows remote control of the first local load device, through the universal format interface, using a universal format different from a local control protocol of the first load device.

2. (Original) The communications system architecture of claim 1 wherein said node element is implemented using modular blocks providing sets of features that can be selectively included or excluded.

3. (Original) The communications system architecture of claim 1 wherein said node element is adapted to selectively enable and disable selected ones of said planes of interaction.

4. (Original) The communications system architecture of claim 2 wherein said sets of features include features to selectively enable and disable said planes of interaction.

5. (Previously Presented) The communications system architecture of claim 1 wherein said global data store is configured to store aggregate information that is periodically updated, wherein the aggregation information provides knowledge of faults

in the electric power network, wherein the node element is reconfigured for supporting at least one of the three planes of interaction based on the knowledge.

6. (Original) The communications system architecture of claim 1 wherein said local data store is configured to store aggregate information that is periodically updated.

7. (Original) The communications system architecture of claim 1 wherein said local data store is configured to store local interface information about with a device associated with said node element.

8. (Original) The communications system architecture of claim 1 wherein a first node element is configured to acquire local interface information about a device associated with said node element and to propagate that local interface information to another node element on said electric power network.

9. (Original) The communications system architecture of claim 8 wherein said first node element acquires local interface information through said inward port and propagates said local interface information through said global port.

10. (Original) The communications system architecture of claim 1 wherein said node element implements said power analysis plane of interaction to collect and disseminate power quality of service information.

11. (Original) The communications system architecture of claim 1 wherein said node element implements said data plane of interaction to couple a device associated with said node element to an external source of information.

12. (Original) The communications system architecture of claim 11 wherein said external source of information is the internet.

13. (Original) The communications system architecture of claim 1 wherein said node element implements said control plane of interaction to control a device associated with said node element.

14. (Original) The communications system architecture of claim 1 wherein said node element implements said power analysis plane of interaction and said control plane of interaction to assess power conditions on said electric power network and to control a device associated with said node element to meet a predefined objective.

15. (Original) The communications system architecture of claim 1 wherein said predefined objective is a self-healing objective to selectively control power consumption to thereby balance load on said electric power network.

16. (Original) The communications system architecture of claim 1 wherein said node element implements a proxy mechanism whereby a device associated with

said node may be controlled by entities external to said device that are coupled to said electric power network.

17. (Original) The communications system architecture of claim 1 wherein said node element implements data encryption to control access to information via said global port.

18. (Previously presented) An appliance for coupling to an electric power network, comprising:

an appliance processor that supports an appliance control interface having an associated data store of appliance control data;

a node element having a global port coupled to said electric power network and an inward port configured to access said data store of appliance control data;

the node element having an embedded proxy component being configured to propagate said appliance control interface through said global port thereby allowing access to said data store of appliance control data from the electric power network.

19. (Original) The appliance of claim 18 wherein said node element is configured to selectably support at least one of three planes of interaction using the information maintained within said global and local data stores:

a power analysis plane of interaction,

a data plane of interaction, and

a control plane of interaction.

20. (Original) The appliance of claim 18 wherein said node element is implemented using modular blocks providing sets of features that can be selectively included or excluded.

21. (Original) The appliance of claim 19 wherein said node element is adapted to selectively enable and disable selected ones of said planes of interaction.

22. (Original) The appliance of claim 18 wherein said node element further includes a global data store that is populated with information supplied via said global port and is accessible via said local port.

23. (Original) The appliance of claim 22 wherein said global data store is configured to store aggregate information that is periodically updated.

24. (Original) The appliance of claim 18 wherein said node element further includes a local data store that is populated with information supplied via said local port and is accessible via said global port.

25. (Original) The appliance of claim 24 wherein said local data store is configured to store aggregate information that is periodically updated.

26. (Original) The appliance of claim 24 wherein said local data store is configured to store local interface information about with a device associated with said node element.

27. (Original) The appliance of claim 18 wherein said node element implements a power analysis plane of interaction to collect and disseminate power quality of service information.

28. (Original) The appliance of claim 18 wherein said node element implements a data plane of interaction to couple said appliance to an external source of information.

29. (Original) The appliance of claim 28 wherein said external source of information is the internet.

30. (Original) The appliance of claim 18 wherein said node element implements a control plane of interaction whereby said appliance may be controlled by information input through said node element.

31. (Original) The appliance of claim 18 wherein said node element implements a power analysis plane of interaction and a control plane of interaction to assess power conditions on said electric power network and to control said appliance to meet a predefined objective.

32. (Original) The appliance of claim 18 wherein said predefined objective is a self-healing objective to selectively control power consumption to thereby balance load on said electric power network.

33. (Original) The appliance of claim 18 wherein said node element implements a proxy mechanism whereby said appliance may be controlled by entities external to said appliance that are coupled to said electric power network.

34. (Original) The appliance of claim 18 wherein said node element implements data encryption to control access to information via said global port.

35. (Previously presented) A method for facilitating interactions among a plurality of devices having at least one of power and analysis monitoring, control and communications capabilities and coupled to one another over a utility power network, the method comprising:

providing each of the devices with an inward port for establishing at least one of a power and analysis monitoring, control and communications link with at least one second device of the plurality of devices which is located downstream in the network;

providing each of the devices with a global port for establishing at least one of a power and analysis monitoring, control and communications link with at least one third device of the plurality of devices which is located upstream in or at a same network layer portion of the network; and

providing each of the devices with at least one globally available local interface, wherein the globally available local interface extracts interaction data from the links established at the global port or the inward port and processes the interaction data to identify source and destination devices corresponding to the established links and to identify at least one of distributed computing instructions, data aggregation instructions, device control instructions and aggregated data clusters, wherein the globally available local interface universally formats at least a portion of the interaction data associated with the link established at the inward port for transmission to at least one of the second device and the third device

providing each of the devices with an embedded proxy component having a universal format interface that makes available said local interface through which remote control of the device may be effected using said universal format.

36. (Previously Presented) The method of claim 35, wherein the device control instructions include information concerning potential or actual faults in the network and at least one alternative for transferring transmission of at least one of power and communications signal energy associated with a first segment of the network to a second segment of the network, thereby self healing the network.

37. (Previously Presented) The method of claim 35 further comprising:

aggregating data received from the second device in accordance with the aggregating data instructions;

formatting the aggregated data into a universal format; and

transmitting the universally formatted aggregated data from the global port to the third device.

38. (Previously Presented) The method of claim 35 further comprising:

processing service data received at the inward port from the second device or first level processed data received at the global port from the third device in accordance with the distributed computing instructions.

39. (Previously Presented) The method of claim 35 further comprising:

aggregating universally formatted data received from the third device in accordance with the aggregating data instructions; and

transmitting the aggregated universally formatted data to at least one of the second device and the third device.

40. (Previously Presented) The method of claim 35 further comprising:

processing interaction data received from the second device or the third device and routing the interaction data to the destination indicated in accordance with real time data transmission criteria included in the interaction data.

41. (Previously Presented) The method of claim 35, wherein at least one of the global port and inner port is adapted to support at least one of a power and analysis monitoring, control and communications link and different protocols and different media.

42. (Currently Amended) A node element apparatus for facilitating interactions among a plurality of devices having at least one of power and analysis monitoring, control and communications capabilities and coupled to one another over a utility power network, the apparatus comprising:

an inward port for establishing at least one of a power and analysis monitoring, control and communications link with at least a second device of the plurality of devices which is located downstream in the network;

a global port for establishing at least one of a power and analysis monitoring, control and communications link with at least a third device of the plurality of devices which is contained in an upstream portion or a same network layer portion of the network; and

at least one globally available local interface coupled to the global port and the inward port, wherein the globally available local interface extracts interaction data from the links established at the global port or the inward port and processes the interaction data to identify source and destination devices corresponding to the established links and to identify at least one of distributed computing instructions, data aggregation instructions, device control instructions and aggregated data clusters, wherein the globally available local interface universally formats at least a portion of the interaction data associated with the link established at the inward port for transmission to at least one of the second device and the third device

wherein the apparatus includes an embedded proxy component having a universal format interface that makes available said local interface and allows remote

control of the apparatus through the universal format interface using a universal format different from a ~~the~~ local control protocol of the apparatus.

43. (Previously Presented) The apparatus of claim 42 further comprising:

a local structured aggregate module for aggregating data received at the inward port in accordance with the aggregating data instructions, formatting the aggregated data into a universal format, and transmitting the universally formatted aggregated data from the global port to the third device.

44. (Previously Presented) The apparatus of claim 42 further comprising:

a global structured aggregate module for aggregating universally formatted data received from a plurality of the third devices and transmitting the globally aggregated universally formatted data to at least one of the third devices.

45. (Previously Presented) The apparatus of claim 42 further comprising:

a global structured aggregate module for processing service data received at the inward port from the second device or first level processed data received at the global port from the third device in accordance with the distributed computing instructions.

46. (Previously Presented) The apparatus of claim 42, wherein the device control instructions include information concerning potential or actual faults in the network and at least one alternative for transferring transmission of at least one of

power and communications signal energy associated with a first segment of the network to a second segment of the network, thereby self healing the network.

47. (Previously Presented) The apparatus of claim 42, wherein the globally available local interface processes interaction action received from the second device or the third device and routes the interaction data to a destination device in the network in accordance with real time data transmission criteria included in the interaction data.

48. (Previously Presented) The apparatus of claim 42, wherein at least one of the global port and the inner port is adapted to support at least one of a power and analysis monitoring, control and communications link having different data signal protocols and on different media.

49. (Previously Presented) The communications system architecture of claim 1 wherein the node element is operable to expose an existing control interface that is for controlling at least one operational function of a HVAC system or a domestic hot water heater.

50. (Previously presented) The method of claim 35, wherein the source and destination devices are home appliances , wherein the globally available local interface universally formats a) data and commands from the source device and complying with a first protocol and b) data and commands from the destination device and complying with a second protocol.

51. (Previously presented) The apparatus of claim 42, wherein the source and destination devices are home appliances , wherein the globally available local interface universally formats a) data and commands from the source device and complying with a first protocol and b) data and commands from the destination device and complying with a second protocol.

52. (Previously presented) The communications system architecture of claim 1, wherein the universal format interface of the proxy is at a first hierarchy level different from the level of the first local load device and allows remote control of the first local load device at the first hierarchy level.

53. (Previously presented) The communications system architecture of claim 1, wherein the node element retrieves and stores data from each of a first plurality of devices using a respective different protocol of that device.